

**CLAIMS**

What is claimed is:

1. An implantable hearing aid actuator, comprising  
a transducer having a body defining an aperture extending through a first side  
5 thereof;  
a first apparatus to couple with a middle ear component of a patient and including  
at least one surface discontinuity located and adapted for inducing patient tissue  
attachment between the middle ear component and the first apparatus;  
a second apparatus responsive to the transducer to communicate axial vibrations  
10 to the first apparatus, wherein the first and second apparatus are selectively connectable  
and disconnectable, and wherein at least the second apparatus is advanceable relative to  
the transducer body through the aperture to interface the actuator and the middle ear  
component.
2. The actuator of Claim 1, wherein the aperture extends through a second  
15 side of the transducer body.
3. The actuator of Claim 1, wherein the first and second apparatus are  
separate structures from the transducer and at least the second apparatus is insertable into  
the aperture of the transducer body.
4. The actuator of Claim 2, comprising:  
20 a coupler for connecting the second apparatus within the aperture of the transducer  
body.
5. The actuator of Claim 4, wherein the coupler is selectively activatable to  
connect and disconnect the second apparatus within the aperture of the transducer body.
6. The actuator of Claim 1, wherein the at least one surface discontinuity  
25 comprises:  
at least one of a complex surface shape, surface pores, and surface asperities.
7. The actuator of Claim 1, comprising:  
a ball on one of the first and second apparatus; and  
a receiver on the other one of the first and second apparatus sized and shaped to  
30 receive the ball.

8. The actuator of Claim 7, wherein one of the first and second apparatus further comprises:

a pair of opposing tangs for application of pressure to open the receiver and uncouple the ball from the receiver.

5 9. The actuator of Claim 1, wherein when the first and second apparatus are connected, the connected first and second apparatus are movable relative to each other to reduce load pressures therebetween.

10. The actuator of Claim 1, wherein the at least one surface discontinuity comprises:

10 at least one of a complex surface shape, surface pores, and surface asperities.

11. An implantable hearing aid actuator, comprising  
a transducer having a body defining an aperture extending through a first side thereof; and

an apparatus, to communicate axial vibrations to a middle ear component of a  
15 patient, wherein the apparatus includes at least one surface discontinuity integrally formed in the apparatus and located on the apparatus for inducing patient tissue attachment thereto, and wherein the apparatus is advanceable relative to the transducer body through the aperture to interface with the middle ear component.

20 12. The actuator of Claim 11, wherein the aperture extends through a second side of the transducer body.

13. The actuator of Claim 12, wherein the apparatus is a separate structure from the transducer and is insertable into the aperture of the transducer body.

14. The actuator of Claim 12, comprising:  
a coupler for connecting the apparatus within the aperture of the transducer body.

25 15. The actuator of Claim 14, wherein the coupler is selectively activatable to connect and disconnect the apparatus within the aperture of the transducer body.

16. The actuator of Claim 11, wherein the at least one surface discontinuity comprises:

at least one of a complex surface shape, surface pores, and surface asperities.

30 17. The actuator of Claim 11, wherein the apparatus comprises:  
a first apparatus to couple with the middle ear component of the patient; and

a second apparatus responsive to the transducer to communicate axial vibrations to the first apparatus, wherein the first and second apparatus are selectively connectable and disconnectable.

5 18. An implantable hearing aid actuator, comprising:  
a transducer;

a first apparatus to couple with a middle ear component of a patient and including at least one surface discontinuity located and adapted for inducing patient tissue attachment between the middle ear component and the first apparatus;

10 a second apparatus responsive to the transducer to communicate axial vibrations to the first apparatus, wherein the first and second apparatus are selectively connectable and disconnectable.

19. The actuator of Claim 18, comprising:  
a ball on one of the first and second apparatus; and  
a receiver on the other one of the first and second apparatus sized and shaped to  
15 receive the ball.

20. The actuator of Claim 19, wherein one of the first and second apparatus further comprises:

a pair of opposing tangs for application of pressure to open the receiver and uncouple the ball from the receiver.

20 21. The actuator of Claim 18, wherein when the first and second apparatus are connected, the connected first and second apparatus are movable relative to each other to reduce load pressures therebetween.

22. The actuator of Claim 18, wherein the at least one surface discontinuity comprises:  
25 at least one of a complex surface shape, surface pores, and surface asperities.

23. The actuator of Claim 18, wherein the first and second apparatus are separate structures from the transducer and at least the second apparatus is insertable into an aperture defined in a body of the transducer.